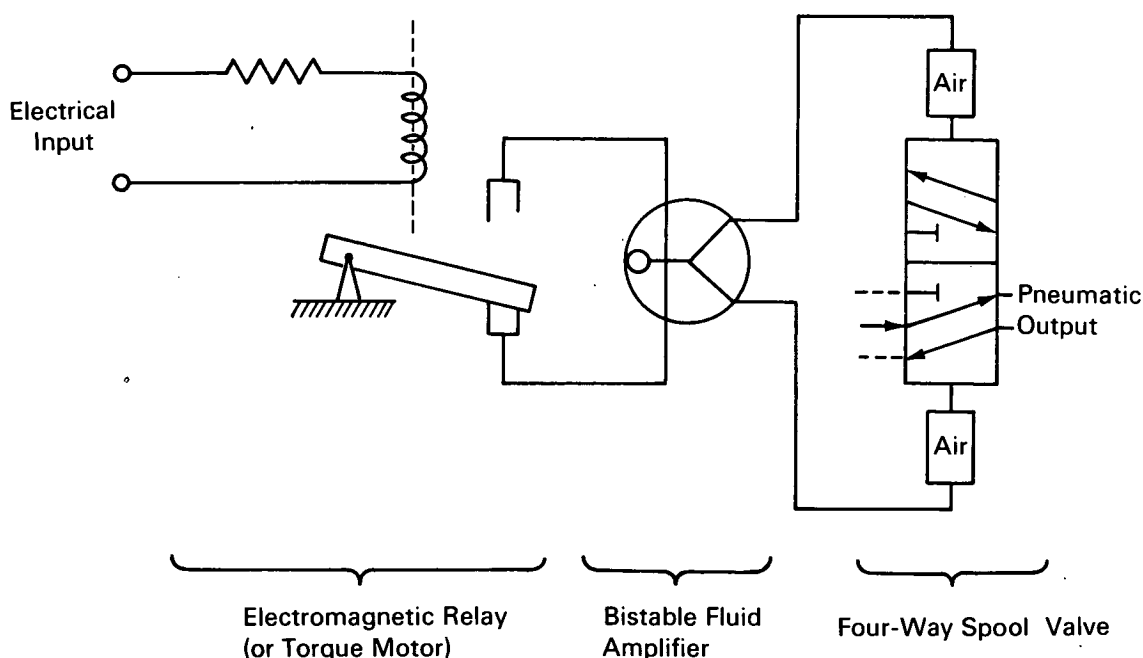


NASA TECH BRIEF



NASA Tech Briefs are issued to summarize specific innovations derived from the U.S. space program, to encourage their commercial application. Copies are available to the public at 15 cents each from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151.

Improved Fluid Control Circuit Operates on Low Power Input



The problem:

To actuate fluid control circuits with low level electrical signals. Commercial solenoid driven valves have been used for this application but require relatively high power levels.

The solution:

A standard, commercially available electromagnetic relay switches a fluid amplifier that, in turn, drives a spool valve.

How it's done:

The relay contacts are replaced by nozzles connected to the control ports of a bistable fluid jet amplifier. In operation, the spring loaded armature of

the relay caps one nozzle or the other as the relay is activated and deactivated. The fluid jet amplifier controls the spool of a mechanical valve handling relatively high volumes and flow rates.

Notes:

1. Use of the electromagnetic relay results in a power requirement of only 10 milliwatts compared to 10 watts required by a solenoid in the same application.
2. By cascading fluid amplifiers and replacing the relay with a torque motor (permanent magnet polarized relay) required power could be reduced to less than 0.1 milliwatt.

(continued overleaf)

3. Frequency response greater than 20 cps may be obtained using the torque motor arrangement; solenoid valves are generally limited to rates below 5 cps.
4. The low input power required permits direct connection with digital computer outputs without amplification.

5. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
Lewis Research Center
21000 Brookpark Road
Cleveland, Ohio 44135
Reference: B67-10042

Patent status:

No patent action is contemplated by NASA.

Source: Vern Gebben
(Lewis-325)